

## AMENDMENTS TO THE CLAIMS

1 – 20 (Previously Canceled)

21. (Currently amended) A system for transmitting multiple data frames to deep packet processing functions in a given sequence, performing the deep packet processing of data in ~~on~~ the frames, and forwarding the processed frames to their destination in the same given sequence, comprising:

- a) an input buffer for receiving frames for processing, having a buffer capacity of at least twice the size of the largest frame size, said buffer incorporated into a Data Moving Unit;
- b) a Frame Header Processing Unit for determining the type of deep packet processing operation to be performed on each frame
- c) a plurality of processing core engines wherein each core engine has its own deep packet processing operation to be conducted on the data in a frame, and an associated memory for storing a frame assigned to the engine until the engine is free to perform a deep packet processing operation on the frame data;
- d) an arbitrator for assigning an ascending frame sequence number to each frame and for forwarding each frame to one of the core engines for deep-packet processing;

- e) an output buffer for collecting each frame as it is processed by a core engine, said buffer having a buffer capacity of at least twice the size of the largest frame size and comprising a portion of the Data Moving Unit; and
- f) a sequencer for forwarding processed frames from the output buffer to their destination in the same order as they are received by the input buffer.

22. (Currently amended) A method of transmitting multiple data frames to deep packet processing functions in a given sequence, performing the deep packet processing of data in ~~on~~ the frames and forwarding the processed frames to their destination in the same given sequence, comprising the steps of:

- a) receiving frames into an input buffer that is incorporated into a Data Moving Unit, said buffer having a buffer capacity of at least twice the size of the largest frame size to be processed;
- b) determining the type of deep packet processing operation to be performed on each frame, using a Frame Header Processing Unit;
- c) assigning each frame to one of a plurality of processing core engines, based upon the processing operation to be conducted on the frame data, each frame being stored in a memory associated with a core engine until the engine is free to perform the processing operation on the frame;
- d) performing at least one deep-packet processing operation on the data in each frame;

- e) collecting the processed frames in an output buffer that is incorporated into a Data Moving Unit, said buffer having a buffer capacity of at least twice the size of the largest frame size to be processed; and
- f) sequencing and forwarding processed frames to their destination in the same order as said frames are received into the input buffer.